

Anions in Cometary Comae

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Abstract:

The presence of negative ions (anions) in cometary comae is known from Giotto mass spectrometry of 1P/Halley. The anions O⁻, OH⁻, C⁻, CH⁻ and CN⁻ have been detected, as well as unidentified anions with masses 22-65 and 85-110 amu (Chaizy et al. 1991). Organic molecular anions are known to have a significant impact on the charge balance of interstellar clouds and circumstellar envelopes and have been shown to act as catalysts for the gas-phase synthesis of larger hydrocarbon molecules in the ISM, but their importance in cometary comae has not yet been explored. We present details of the first attempt to model the chemistry of anions in cometary comae. Based on the combined chemical and hydrodynamical model of Rodgers & Charnley (2002), we investigate the role of large carbon-chain anions in cometary coma chemistry. We calculate the effects of these anions on coma thermodynamics, charge balance and examine their impact on molecule formation.

References:

Chaizy, P. et al. 1991, *Nature*, 349, 393

Rodgers, S.D. & Charnley, S.B. 2002, *MNRAS*, 330, 660